INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1996	**Park:** Shenandoah NP
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Permit#:
SHEN1996ARVK

Park-assigned Study Id. #:
unknown

Project Title:
Nitrification In Disturbed Forest Soils (N-187)

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1998
Study Start Date: Jan 01, 1994	**Study End Date** Jan 01, 1997

Study Status:
Completed

Activity Type:
Research

Subject/Discipline:
Water Resources

Objectives:

In an effort to understand the causes of regionally elevated nitrate export from watersheds in upland western Virginia concurrent with widespread forest defoliation by the gypsy moth, we are investigating the trophic basis of soil microbial nitrification in soils in this region. Two fundamentally different microbial trophic pathways can contribute to soil nitrification: heterotrophic nitrification and autotrophic bacterial nitrification. These two modes of nitrification have quite different controls. Identifying the trophic basis of nitrification in our subject soils will unlock information on the ecosystem-level controls on the production of oxidized nitrogen products in this region.

Findings and Status:

We employed a field experimental approach to evaluate the ecosystem-level nutrient cycling controls on the relative contributions of autotrophs and heterotrophs to nitrification in Shaver Hollow Watershed (SNP), Virginia. We established fourteen 2m x 2m plots under a 60-yo mixed hardwood canopy on a north-facing, fertile hillslope in the watershed. We experimentally varied carbon and nitrogen inputs and observed the responses of heterotrophic and autotrophic nitrifying populations. Specifically, in July 1996 we added 50 kg N/ha/yr to triplicate plots; 1000 kg C/ha/yr to a second set of triplicate plots; and 50 kg N + 1000 kg C/ha/yr to a third set of triplicate plots. The remaining 5 experimental plots were retained as controls. Soils were sampled from all plots each plot on each sampling date, a suite of soil chemical and microbiological variables were measured. The bulk of laboratory analyses have been completed. Completion of laboratory analysis of samples and statistical evaluations of data will be completed in March 1997. Preliminary results are available. No further field work has yet been specifically scheduled, although the plots will be maintained through the summer of 1997.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?
No

Funding provided this reporting year by NPS: 0	**Funding provided this reporting year by other sources:** 0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0